



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
Carlsbad Field Office  
2730 Loker Avenue West  
Carlsbad, California 92008

February 26, 1997

To: Field Supervisor

From: Deputy Field Supervisor

Subject: Biological Opinion on Fish and Wildlife Service Participation in a Memorandum of Understanding with the San Diego County Fire Chiefs Association Addressing Flammable Vegetation Abatement in San Diego County (1-6-97-FW-19)

This document represents the U.S. Fish and Wildlife Service's (Service) biological and conference opinions in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act), and 50 CFR 402, concerning the effects on the species discussed below of signing a Memorandum of Understanding (MOU) with the San Diego County Fire Chiefs' Association (Fire Chiefs), the California Department of Fish and Game (Department), the Fire Districts' Association of San Diego County (Fire Districts), and the California Department of Forestry (CDF). The MOU is intended to establish standards for the abatement of flammable vegetation for the purpose of protecting public safety pursuant to State law, County and District ordinances, and city municipal codes. The standards are intended to provide adequate fire protection, while minimizing the impacts to federally listed species and rare habitats resulting from such vegetation removal. The parties to the MOU are mutually interested in an accounting of all anticipated and actual removal of coastal sage scrub vegetation so that it may be assessed at the county-wide level for its impacts to biological resources and that it may be approved by the Service and CDFG, thus obviating the need for permitting at the local level. The terms of the MOU are limited to existing urban-wildland interface within the county with the understanding that eventually all such interface will be brought into compliance with fire protection standards and perpetually maintained in such a condition as to no longer be regarded as natural habitat.

At issue with the Service's proposed participation in this agreement are potential direct and indirect impacts to the following federally listed endangered and threatened species:

### Listed Species:

coastal California gnatcatcher (*Poliophtila californica californica*),  
Stephen's kangaroo rat (*Dipodomys stephensi*),  
California red-legged frog (*Rana aurora draytonii*),  
southwestern arroyo toad (*Bufo microscaphus californicus*),

Pacific pocketmouse (*Perognathus longimembris pacificus*)  
Riverside fairy shrimp (*Streptocephalus wootoni*)  
least Bell's vireo (*Vireo bellii pusillus*)  
southwestern willow flycatcher (*Empidonax traillii extimus*)  
San Diego fairy shrimp (*Branchinecta sandiegonensis*)  
Laguna Mountains skipper (*Pyrgus ruralis lagunae*)  
Quino checkerspot butterfly (*Euphydryas editha quino*)

San Diego button celery (*Eryngium aristulatum* var. *parishii*)  
California Orcutt grass (*Orcuttia californica*)  
San Diego mesa mint (*Pogogyne abramsii*)  
Otay mesa mint (*Pogogyne nudiuscula*)  
Orcutt's spineflower (*Chorizanthe orcuttiana*)  
Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)  
Encinitas baccharis (*Baccharis vanessae*)

Proposed Species:

Dehesa beargrass (*Nolina interrata*)  
spreading navarretia (*Navarretia fossalis*)  
San Diego thornmint (*Acanthomintha ilicifolia*)  
thread-leaved brodiaea (*Brodiaea filifolia*)  
Otay tarplant (*Hemizonia conjugens*)  
willowy monardella (*Monardella linoides* ssp. *viminea*)

Other listed species that occur in San Diego County, including: desert pupfish (*Cyprinodon macularius*), Mojave tui chub (*Gila bicolor mojavensis*), tidewater goby (*Eucyclogobius newberryi*), brown pelican (*Pelecanus occidentalis*), California least tern (*Sterna antillarum browni*), light-footed clapper rail (*Rallus longirostris levipes*), western snowy plover (*Charadrius alexandrinus nivosus*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), and peregrine falcon (*Falco peregrinus*) are not expected to be affected by implementation of the flammable vegetation abatement program and therefore are not addressed in this Biological Opinion.

This Biological Opinion was prepared using the following information: Multiple Species Conservation Program (MSCP) Resource Document; Multiple Habitat Conservation Program (MHCP) Files; State Assembly Bill No. 337 Chapter 1188 (Bates Bill); draft MOU between the Service, Department, CDF, Fire Chiefs, and Fire Districts; the SANDAG Analysis of Estimated Habitat Loss Due to Fire Clearing; other documents listed in the reference section; additional information obtained during consultation including field investigations, telephone conversations, and correspondence with the agencies listed above; and other information in Service files.

## BIOLOGICAL OPINION

After reviewing the current status of the aforementioned listed species, the environmental baseline for the action area, the effects of the flammable vegetation abatement program, and cumulative effects, it is the Service's biological opinion that its participation in the MOU regarding flammable vegetation abatement in San Diego County, and implementation of this program, as proposed and in accordance with the measures required herein, is not likely to jeopardize the continued existence of the coastal California gnatcatcher, arroyo toad, Stephen's kangaroo rat (SKR), California red-legged frog, Laguna Mountains skipper, Quino checkerspot butterfly, Pacific pocketmouse, San Diego button celery, California Orcutt grass, San Diego mesa mint, Otay mesa mint, Riverside fairy shrimp, San Diego fairy shrimp, least Bell's vireo, southwestern willow flycatcher, Dehesa beargrass, spreading navarretia, San Diego thornmint, Del Mar manzanita, Encinitas baccharis, thread-leaved brodiaea, Orcutt's spineflower, Otay tarplant, and willowy monardella.

Critical habitat has been designated for the least Bell's vireo and proposed for the southwestern willow flycatcher within the action area. Since riparian zones will be avoided as part of this biological opinion, no critical habitat will be adversely modified or destroyed by implementation of the MOU.

## DESCRIPTION OF THE PROPOSED ACTION

### **Background**

In 1988, the CDF mapped San Diego County and established fire hazard severity zones of "very high", "high" and "moderate" for the county's unincorporated areas. Cities within San Diego County have established similar zones for their jurisdictions. Very High Fire Hazard Severity Zones are defined as "any geographic areas designated per Government Code Section 51178 to contain the type and condition of vegetation, topography, weather, and structure density to potentially increase the possibility of wildland conflagration fires". The Bates bill (State of California), enacted in 1992, requires that new development address fire protection issues within the footprint of the development. The MOU addressed herein derives from regular meetings among the Service, the Department, and the Fire Chiefs in 1995, held to discuss remedial actions for bringing all wildland-urban interfaces in the county into compliance with minimal fire protection standards, pursuant to state and local law. It was agreed that such a retroactive approach would best be accomplished by county-wide policies and standards. The Fire Chiefs are currently developing wildland-urban interface vegetation management standards that emulate the requirement for fire protection measures, including vegetation abatement, to occur within the property lines of lands proposed for development. The Service and the Department were requested to provide overall approval for the large-scale establishment of adequate and standardized fuel management practices. The Service and Department issued, under the authority of the Natural Community Conservation Planning (NCCP) program, a joint statement dated February 2, 1995, that exempted the loss of coastal sage scrub (CSS) vegetation

associated

with public health and safety from certain requirements of the NCCP program (i.e. mitigation). The MOU would concern both the CSS habitat and other habitats supporting listed species within fuel (vegetation) management zones.

Throughout southern California there are thousands of existing homes in areas designated as high and very high fire hazard severity zones. The Fire Chiefs and Fire Districts within San Diego County are mandated to provide for the safety of citizens by preventing and suppressing fire. As part of this mission, fire personnel work to ensure defensible space around structures, which often entails the removal of flammable vegetation to reduce the fuel loads near combustible structures. Since many existing structures in San Diego County abut natural habitat areas, providing defensible space can result in the modification or destruction of natural habitat.

### **Proposed Action**

The proposed action is for the Service to enter into an MOU (Appendix 1) with the Fire Chiefs, Fire Districts, CDF, and Department and to participate in an advisory capacity in the annual planning and implementation of flammable vegetation abatement activities. However, it is understood among all involved parties that the Service's involvement will be limited to situations where native habitats are concerned. It is the goal of this agreement that all wildland-urban interface that is currently in non-compliance with fire protection regulations will eventually be brought into compliance and maintained thereafter as non-native habitat. It will be incumbent upon the Fire Chiefs, CDF, and the Fire Districts to notice, inspect, and enforce vegetation clearing standards with sufficient frequency to prevent the recovery of natural habitat in cleared areas. In this sense, the Service's active involvement will decrease over time. The specific objective of the MOU is to provide for the establishment of vegetation management guidelines that avoid and minimize potential adverse impacts to threatened and endangered species, while allowing the Fire Chiefs, Fire Districts and CDF to continue flammable vegetation abatement pursuant to the state of California fire protection policies and local County ordinances. Such guidelines will provide a uniform standard for compliance with state and municipal health and safety codes.

The activities addressed in this biological opinion include flammable native vegetation removal on parcels on the urban/wildland interface in San Diego County. The majority of the urban-wildland interface lies in the western portions of San Diego County, within the boundaries of the MSCP and MHCP planning areas. Vegetation abatement may include: (1) removal of all hazardous shrubs, trees, grasses and herbs located up to 100 feet from any occupied structure, and up to 30 feet of any roadway; (2) removal of vegetation on unimproved property in, instances

deemed necessary based on written findings by the Chief of the local fire department, with written notification to the Department and the Service.

By actively engaging the Service in the planning process for flammable vegetation abatement

through the MOU, the Fire Chiefs, CDF, and Fire Districts intend to minimize adverse impacts to

listed species while assuring fire protection to structures in areas at risk of fire. Measures to

avoid and minimize the effects to federally listed species resulting from this program are not specifically identified in the MOU. However, it states that the signatories shall comply with the "reasonable and prudent measures" and the "terms and conditions" identified in this Biological Opinion (BO), which set forth such avoidance and minimization measures. The intent of the MOU is for the Fire Chiefs, CDF, and Fire Districts to implement such measures to the extent that implementation does not detract from the State and locally mandated provision of fire protection.

### **Action Area**

The action area is restricted to the wildland-urban interface on all non-federal lands within San Diego County, California at the time the MOU is signed. The environmental setting in which the Fire Districts implement vegetation abatement programs include both suburban and rural areas. Quantification of anticipated habitat losses from the proposed action on a county-wide basis is difficult. A general, GIS-based analysis performed by SANDAG (1995) for the MSCP and MHCP areas, combined with County habitat mapping efforts for the east county, indicate that 697,374 acres of the MSCP-MHCP and 915,674 acres of the east county are currently in natural habitats. Approximately 3,743 acres of the total 1,613,048 natural acreage (0.2%) lie within 100 feet of development.

### **Flammable Vegetation Abatement Guidelines**

San Diego County has numerous fire districts, each of which operates under a different set of local ordinances concerning fire. All local ordinances, however generally, comply with State Public Resources Codes (SPRC) 4290 and 4291, which designate fuelbreak widths surrounding structures. The Bates Bill updated SPRC 4290 and 4291. The Bates Bill (Appendix 2), section 51182 addresses the establishment of fuelbreaks around occupied structures through removal of vegetation, providing for a 30-foot minimum width for vegetation removal around structures, and allowing for a fuelbreak between 30 and 100 feet in width, where 30 feet is deemed insufficient by the fire chief. Section 51184 exempts certain areas from the requirements of 51182: (1) Habitat for endangered or threatened species, (2) lands kept in a predominantly natural state as habitat, and (3) open space lands that are environmentally sensitive parklands. In accordance with the Bates Bill, the Fire Chiefs are developing Wildland/Urban Interface Standards for existing developing interface that reiterate the requirement for fire protective measures, including vegetation abatement, required to occur within the property lines of lands proposed for new development. An important component of this guidance will be the development of building setbacks sufficient to allow room for fire break establishment within property lines. Impacts and mitigation for habitat lost to future development would be addressed through the appropriate permitting and planning processes. Because future fire protection needs

are addressed in the Bates Bill, the MOU addresses vegetation abatement only around structures existing at the time of signature.

Section I of the MOU states that property owners and their lessees, CDF, fire districts, and cities shall be permitted to clear all flammable vegetation within a 100-foot radius of all dwelling structures using methods such as mowing and trimming that leave the plant root structure intact for soil stabilization. Discing will only be used when deemed necessary by the local fire chief. It is recognized that less than one hundred feet of clearing is biologically preferable, but the fire chiefs retain the ability to clear up to 100 feet at their discretion. The term "structure" does not include fences or similar barriers enclosing or separating areas of land. This is a departure from some districts' current firebreak establishment practices, which establish a fuelbreak based on property lines rather than the presence of existing structures.

Section II of the MOU, addressing notification of landowners, requires fire agencies to develop publicly available guidelines for flammable vegetation removal. Such guidelines will serve to educate and advise landowners of methods of vegetation removal or structure protection that minimize effects to native habitats and soil stability. Specific notices will specify the location on the property in which vegetation needs to be removed. Landowners who have received notice from the Department or the Service of the existence of rare, threatened, or endangered species on their properties, must notify the Department and/or the Service as applicable prior to clearing vegetation from their property. The Service or Department will have 10 days in which to address the issue. This clause is designed to minimize impacts to state and federal listed species.

Section III of the MOU releases property owners and their lessees, CDF, fire districts and cities from the obligation to perform biological surveys prior to performance of the fire protection activities established by the guidelines described above.

### STATUS OF THE SPECIES

The following information on listed and proposed plant and animal species has been excerpted from notices in the United States Federal Register. More detailed accounts on species' biologies may be found in the references given below.

#### **Endangered Animal Species**

##### Arroyo toad

*Bufo microscaphus californicus* is restricted to rivers that have shallow, sandy or gravelly pools beside sandy terraces. Breeding occurs on larger streams and rivers with persistent water from late March to mid-June (Sweet 1989). Eggs are deposited and larvae develop in shallow pools with minimal current and little or no emergent vegetation and with sand or pea gravel substrate overlain with flocculent silt. After metamorphosis (June-July), the juvenile toads remain on the bordering gravel bars for a period of three to eight weeks, depending on site and year, until the

pool no longer persists (Sweet 1992). Juveniles and adults forage for insects on sandy stream terraces that have nearly complete closure of cottonwood, oak, or willow canopy and almost no grass or herbaceous cover. Adult toads excavate shallow burrows on the terraces where they shelter during the day when the surface is damp, or during longer intervals in the dry season (Sweet 1989). Arroyo toads have also been found up to one kilometer from drainages. Use of upland areas including chaparral, coastal sage scrub and oak woodland may occur for up to 10 months of the year. Toad use of such areas is probably related to foraging, refugia and movement between drainages (Karen Jensen, pers. comm. 1996).

Arroyo toads are especially sensitive to stream diversions due to the toad's breeding well after the normal rainy season. Water diversions that alter normal flows degrade habitat and adversely affect arroyo toads by leading to: 1) the early drying of breeding pools, causing breeding failure or loss of the larval population; 2) restriction of the period essential for rapid growth when newly-metamorphosed toads can forage on damp gravel bars; and 3) loss of damp subsurface soil that may result in high adult mortality during late summer and early fall (Sweet 1992).

Development in riparian wetlands has caused permanent losses of riparian habitats and is the most conspicuous factor in the decline of the arroyo toad (Sweet 1991). Habitat losses have resulted in the reduction and isolation of toad populations on drainages. Stream terraces have been converted to farming, road corridors, and residential and commercial uses, while the streams themselves have been channelized for flood control. Large stretches of riparian corridors have also been degraded or destroyed by cattle grazing and feral pig foraging. Horse and cattle grazing in riparian areas may also trample eggs and larvae of arroyo toads (Sweet 1991). Heavy equipment in yearly reconstruction of roads and stream crossings have had significant and repeated impacts to arroyo toads. The effects of direct damage to toad habitat to local populations can be exacerbated by exotic predators.

Arroyo toads were historically found along the drainages in southern California from San Luis Obispo to San Diego County and southward in northern Baja California. They have been extirpated from an estimated 75 percent of their former range in the United States. The arroyo toad was listed as endangered on December 19, 1994 (59 FR 64859) due to the above described threats.

#### Stephens' kangaroo rat

The present geographic range of Stephens' kangaroo rat includes the Anza, Perris, and San Jacinto Valleys and other areas of western Riverside and northwestern San Diego Counties. This geographic range is estimated to encompass approximately 287,000 hectares (708,641 acres), which is unusually small for rodents in general and kangaroo rats in particular. The majority of the Stephens' kangaroo rat's range occurs in western Riverside County, with the only other significant populations found at Camp Pendleton Marine Corps Base, the adjacent Fallbrook Naval Weapons Station, and sites around Lake Henshaw in northern San Diego County.

The Stephens' kangaroo rat feeds on both green vegetation, seeds, and, to a limited extent, insects. The spring growing season and increased availability of food coincide with the Stephens' kangaroo rat's reproductive peak. This species will create its own burrow system in areas with sandy soils and use existing burrow systems of gophers and ground squirrels in areas

of compacted soils. Field surveys and literature review by O'Farrell and Uptain (1989) documented 132 populations sites over the entire range of the Stephens' kangaroo rat, including previously known (77), new (47), and potential (8) populations. Of those populations previously identified in the California Department of Fish and Game 1973 Stephens' kangaroo rat survey report, 45 had been extirpated. Population disappearances were attributed to natural seasonal and annual population fluctuations, natural succession and maturation in plant communities, and habitat destruction associated with agricultural and urban development.

The Stephens' kangaroo rat is found almost exclusively in open, often disturbed, nonnative grasslands or in sparse shrublands with cover of less than approximately 30 percent (Hogan 1981). Stephens' kangaroo rat has been found on 36 types of well-drained soils, and more than 125 soils are thought to be potentially suitable for the species. Potentially suitable soils include those types capable of supporting annual grasses mixed with forbs and shrub species. Additionally, soils must exhibit compaction characteristics suitable for the establishment of burrows.

Stephens' kangaroo rat populations have a patchy distribution. This distribution appears to depend on soil type, vegetative stage, and slope (O'Farrell and Uptain 1989). These authors hypothesized that the species is adapted for existence in intermediate vegetative seral stages. Areas disturbed by farming, and subsequently allowed to go fallow, allow invasion by weedy species and rodents such as the Botta's gopher that facilitate colonization of the area by the Stephens' kangaroo rat. Apparently, without some process that maintains relatively open grass or forb lands, eventual succession or maturation of vegetative communities render habitat unsuitable for the Stephens' kangaroo rat.

Much of the habitat over the range of the species was historically converted to agriculture. Since about 1984, urban expansion has increased. These two land-use changes have contributed to the decline and fragmentation of Stephens' kangaroo rat populations and remain the primary threat to the continued existence of the species. The Stephens' kangaroo rat was federally listed as endangered in September 1988 (53 FR 38465).

#### Southwestern willow flycatcher

This subspecies (*Empidonax traillii extimus*) is composed of declining, widely separated populations on large riparian systems in the arid southwest. Its range includes southern Nevada, Arizona, New Mexico, southern Utah, southern Colorado, northern Mexico, and southern California. Small numbers of breeding pairs of southwestern willow flycatchers occur in southern California from the Owens Valley and south fork of the Kern River to northern San



Diego County (Garrett and Dunn 1981, Unitt 1984 and 1987, Zeiner et al. 1990). Breeding locations include the Santa Ynez River near Buellton, the Prado Basin riparian forest in Riverside County, and the Santa Margarita and San Luis Rey Rivers in San Diego County. The species breeds on the Santa Margarita River in northern San Diego County and may breed as far south as the San Dieguito River in this county (J. Lovio, unpubl. obs.). No records indicative of

local breeding have been made on rivers in southern San Diego County since the 1970's (Garrett and Dunn 1981, Unitt 1984), although suitable habitat remains on several reaches.

Southwestern willow flycatchers winter in Veracruz and Oaxaca, Mexico, and south to Panama (Ehrlich et al. 1988). They are one of the latest spring transients and virtually never arrive in, California before May 10. Migrants can be found in apparently suitable breeding habitat as late as June and cannot be assumed to be breeding birds (Garrett and Dunn 1981).

Southwestern willow flycatchers breeding at lower elevations require extensive riparian woodlands of predominantly willow (*Salix* spp) and cottonwood (*Populus fremontii*) along larger streams and rivers or smaller spring-fed or boggy areas with willows or alders (*Alnus* spp.) (Zeiner et al. 1990). This species typically requires dense willow thickets for nesting and roosting, but has also been known to nest in live oak and in saltcedar (*Tamarix* spp). Less exposed branches which are found along the margins of thickets and within clearings provide important singing posts and hunting perches. Serena (1982) found that activities such as cattle browsing displaced the willow flycatcher from otherwise suitable habitat in the Sierra Nevada. Breeding territories normally occur in association with water, such as languid streams, standing water, or seeps. Water is always present in the early stages of the breeding cycle but may not be present at later stages. Migrating willow flycatchers occur in a wide range of habitats (Small 1994).

Male willow flycatchers arrive on breeding grounds in late May to early June, with females arriving approximately 1 week later (Garrett and Dunn 1981). Peak egg laying occurs in June. The average clutch size is three to four eggs, which are incubated by the female for approximately 12 days. Nest abandonment and renesting attempts following parasitism by brown-headed cowbirds have been observed (Zeiner et al. 1990). Adults and fledglings remain, in general, on breeding areas through August; transients are seen in California through the middle of September (Zeiner et al. 1990).

The primary cause of southwestern willow flycatcher decline is considered to be loss of riparian habitats through alteration or destruction. Cattle grazing and brown-headed cowbird parasitism also appear to be significant factors related to decline (Serena 1982). Cowbird parasitism of willow flycatchers is frequent, particularly in the lowland populations, and seems to heavily impact nesting success (Gaines 1977). The southwestern willow flycatcher was listed as endangered in February, 1995 (60 FR 10694).

Critical habitat for this species has been proposed for the following drainages in San Diego

County (July, 1993; 58 FR 39506): Santa Margarita River, San Luis Rey River, San Dieguito River, San Diego River, and Tijuana River.

### Pacific pocketmouse

*Perognathus longimembris pacificus* (PPM) is a small heteromyid rodent which was historically reported to occur within about 3 kilometers (2 miles) of the immediate coast at eight locations from Marina Del Rey and El Segundo in Los Angeles County south to the vicinity of the Mexican border in San Diego County. Erickson (1993) reported that *Perognathus longimembris pacificus* was historically recorded at two general locales on Camp Pendleton, the San Onofre Area and the Santa Margarita River Estuary.

The PPM is known to inhabit fine-grained, sandy substrates and inhabits coastal stands, coastal dunes, river alluvium, and coastal sage scrub vegetation on marine terraces (von Bloeker 1931, Grinnell 1933, Meserve 1972, Erickson 1993). Known extant populations of this species are found on the Dana Point Headlands in Dana Point (Orange County) (Brylski 1993) and at Camp Pendleton (San Diego County). The results of trapping performed at Camp Pendleton in 1995 suggested that the core of the PPM population was confined to sandy soils with low vegetative cover. However, one site was an ecotone strip of sparse white sage-dominated scrub between coastal sage scrub and non-native grassland.

Little quantitative information is available on the ecology and life history of the Pacific pocket mouse. However, the attributes of the little pocket mouse (*Perognathus longimembris*) and available data on the *pacificus* subspecies suggest that this small rodent is facultatively or partially fossorial, relatively sedentary, primarily granivorous, and able to become torpid, estivate, or hibernate in response to adverse environmental conditions (Ingles 1965, Kenagy 1973, Federal Register 1994).

*Perognathus longimembris pacificus* was listed by the Service as an endangered species under the emergency provision of the Endangered Species Act on February 3, 1994, due to its imminent danger of extinction. This action became final in September of that year.

### Riverside fairy shrimp

The Riverside fairy shrimp is a small freshwater crustacean in the Family Streptocephalidae of the Order Anostraca. The species was first collected in 1979 by Dr. Clyde Erickson and was identified as a new species in 1985 (Eng et al. 1990).

The Riverside fairy shrimp was listed as endangered on August 3, 1993 (58 FR 41391), after the Service determined that the present range and continued existence of the species was being

rapidly destroyed by habitat loss and degradation due to urban and agricultural development, off-road vehicle use, trampling, and other factors.

The northern range of the Riverside fairy shrimp is four vernal pools near Temecula, in Riverside County, and two populations in Orange County. It is found in a few pools on Naval Air Station Miramar, Camp Pendleton, and on Otay Mesa. In Baja California, Mexico it has been found in

Valle de las Palmas, and at Baja Mar north of Ensenada (Brown, Wier, and Belk 1993).

#### Least Bell's vireo

The breeding range of the least Bell's vireo is restricted to California and northern Baja California, Mexico. Its historic range was from near Red Bluff in Tehama County south through the San Joaquin Valley to the Kern River, the inner southern Coast Range, and the southern California valleys west of the deserts to the Mexican border (Steinhart 1990). In the desert region it once occurred along the Mojave River, in the Owens Valley, and in Death Valley National Monument (Small 1994). Currently, this subspecies persists only in the southern part of the former range: breeding pairs have been found during the 1990's in the counties of Inyo, Santa Barbara, San Bernardino, Ventura, Los Angeles, Orange, Riverside, and San Diego. However, the majority of the breeding pairs are concentrated from western Riverside County through San Diego County. The Santa Margarita River in northern San Diego County supports the highest local concentration (Small 1994, USFWS 1995).

Breeding habitat for the least Bell's vireo consists primarily of valley riparian habitats from near sea level on the coast to 1,500 feet above mean sea level (msl) in the interior (Small 1994). Areas with relatively dense riparian shrubs are required, preferably where flowing water exists, though desert breeders may nest along dry watercourses where mesquite and arrow weed are located nearby (Small 1994). Males establish breeding territories which range from 0.3 to 1.3 hectares (Collins et al., 1989, in Brown 1993). The territory is maintained mostly by male song. Nests are typically built within 1 meter of the ground in the fork of willows (*Salix* spp.), rose (*Rosa* spp.), mule fat (*Baccharis salicifolia*), or other ground cover. Peak egg laying begins in May and continues into early June (Zeiner et al. 1990). Egg laying begins 1 to 2 days after nest completion and lasts 4 days. Suitable nesting habitat appears to be the primary aspect limiting numbers, with rates of cowbird parasitism being secondary (Brown 1993). As early as 1920, biologists reported that it was difficult to find a least Bell's vireo nest that hadn't been parasitized by brown-headed cowbirds (Steinhart 1990). By 1930, populations of both *Vireo bellii pusillus* and *V. b. arizonae* began to decline throughout California and the rate of decline increased in the years of World War II onward (Gaines 1977, Goldwasser 1978 in Small 1994, USFWS 1995). Causes for decline included destruction of habitat due to river channelization, water diversions, lowered water tables, gravel mining, agricultural development, and brood-parasitism by the Brown-headed cowbird (*Molothrus ater*). The self-introduction of the cowbird into California was facilitated by agricultural practices early in the 20th Century (Laymon 1987).

The least Bell's vireo was state listed as endangered in 1980 and federally listed as endangered in 1986, when the total state population was estimated at between 300 and 400 breeding pairs. Since then the state-wide population has increased to over 1000 pairs; much of this been attributed to habitat protection, active restoration and passive recovery of disturbed habitat, and programs of trapping and removing cowbirds from riparian habitats (Small 1994, USFWS 1995).

#### Laguna Mountains skipper

The Laguna Mountains skipper is a small butterfly within the skipper family (Hesperiidae). It is a small checkered skipper found in mountain meadow habitats in the Laguna and Palomar Mountains. This animal has a wing span of about 3 centimeters (cm) (1 inch) and is distinguished from the rural skipper (*P. ruralis ruralis*) by extensive white wing markings that give males an overall appearance of white rather than mostly black and by the banding patterns on the hind wings (Scott 1981; Levy 1994).

Cleveland's horkelia (*Horkelia clevelandii*) is the larval host plant of the Laguna Mountains skipper. Although a butterfly's distribution is primarily defined by the presence of its larval host plant, it may be further restricted by other physiological or ecological constraints. The Laguna Mountains skipper is currently found in a few open meadows of yellow pine forest between 1,500 and 2,000 meters (5,000 and 6,000 feet) in elevation. Historically, this species was found at elevations between 1,200 and 2,500 meters (4,000 to 6,000 feet) and it may have occurred throughout the higher elevations of San Diego County (Murphy 1990; Brown 1991; J. Brown, in litt., 1992; and references cited therein). However, it has been a rare species for the last 20 to 55 years.

The Laguna Mountains skipper is apparently bivoltine (two generations per year). The adult flight season occurs from April to May with a second brood flight in late June to late July (Brown 1991; Levy 1994). It is assumed that the life history of the Laguna Mountains skipper is similar to that of the nominate subspecies (*P. r. ruralis*), which diapauses as full-grown larvae and adults live 10 to 20 days (J. Brown, in litt., 1992).

The Laguna Mountains skipper was listed as endangered on January 16, 1997 (62 FR 2313) due to habitat destruction and degradation from overgrazing and trampling of its larval host plant by domestic cattle. Fire management practices may have also contributed to the decline. Mountain meadows were historically subject to localized periodic fires, which maintained the vegetative diversity of the meadows. The larval host plant, Cleveland's horkelia may require fire to keep competitors reduced (Levy 1994). Cleveland's horkelia is itself a relatively rare species and only found in the Laguna, Cuyamaca, and San Jacinto Mountains of southwestern California, and northwestern Baja California, Mexico (Hickman 1993). Before 1994, the last known locality of a Laguna Mountains skipper population in the Laguna Mountains is in a campground area of the Forest (Murphy 1990; D. Hogan, pers. comm., 1993). Currently four of five populations of Laguna Mountains skipper are not subject to livestock grazing. The fifth

population occurs in the Mendenhall Valley. The USFS owned portions of this valley, where the magnitude of livestock grazing has been reduced. The Laguna Mountains skipper population was found to occupy both the private land and USFS land in this valley.

The Laguna Mountains skipper is currently found at three sites in the Mount Palomar region of San Diego County, California (Levy 1994). The population in the Laguna Mountains in San Diego County, California (Dr. John Brown, in litt., 1992) was not seen in 1994 (Levy 1994). It

was last seen in the Laguna Mountains occupying a small area along a fence in a USFS campground in 1986 (Murphy 1990; D. Hogan, pers. comm., 1993; Levy 1994) and was sighted here again in May of 1995 (Levy in litt. 1995). The population size of the Laguna Mountain population was estimated to be fewer than 100 individuals (Murphy 1990; Brown 1991; J. Brown, in litt., 1992). The largest of the Palomar population is estimated to be 240 individuals (Levy 1994). The Laguna Mountains skipper was sighted and collected on Mount Palomar in 1991 by D. Lindsley (J. Brown, in litt., 1992; Dr. John Brown, pers. comm., 1993). Two additional Mount Palomar populations were located in 1994 (Levy 1994). It was sighted in the USFS campground in the Laguna Mountains, again, in 1995 by Dr. Levy. Historically, the Mount Palomar populations were small compared to the populations in the Laguna Mountains, where only five specimens have been reported in this century (J. Brown, in litt., 1992).

#### Quino checkerspot butterfly

The Quino checkerspot butterfly (*Euphydryas editha quino*) is a medium sized member of the brush-footed butterfly family (Nymphalidae). It has a wingspan of approximately 2.5 centimeters (1 inch) and the wings have a checkered pattern consisting of brown, red, beige, and black. The Quino checkerspot butterfly ranges from the Santa Monica Mountains in California south into extreme northwestern Baja California, Mexico. Adults have been found from sea level to about 900 meters (3,000 feet). The Quino checkerspot butterfly inhabits open grassland, and ecotone areas between grasslands and coastal sage scrub, chaparral, and sparse native woodlands.

The adults are on the wing from approximately mid-January to late April. The eggs hatch in about ten days and the larvae begin to feed immediately on the food plant, plantain (*Plantago* species) or perhaps owls-clover (*Castilleja exserta*). First instar larvae enter into an obligatory diapause as summer approaches and the food plants dry up. Extended periods of diapause may occur during times of drought. After termination of diapause, the larvae feed on the food plants and then enter their pupal stage. The adults emerge within two-four weeks, feed, disperse, reproduce, and then die.

Fifty to seventy-five percent of the range of the Quino checkerspot butterfly has been lost since 1900 as a result of habitat degradation or destruction. The animal also is endangered by over-grazing, poorly planned fire management practices, over-collection by butterfly collectors, off-road vehicles, and displacement of the larvae food plants and adult nectar sources by invasive

exotic vegetation.

The Quino checkerspot butterfly may have been one of the most abundant butterflies in coastal southern California until the 1980's. Currently, only seven or eight populations are known with the United States and one in Mexico. These populations are located in San Diego and western Riverside County. One of the populations in Riverside County currently is imperiled by a proposed residential project. The last individuals at a population at Otay Lake in San Diego were seen in 1990. In 1996, a small population was located on the western slope of Otay

Mountain, but the effects of a major brush fire on these animals will not be known until the 1997 flight season. The other known populations are based on sightings of five adults or less.

#### San Diego fairy shrimp

The San Diego fairy shrimp is a small freshwater crustacean in the Family Branchinectidae, of the Order Anostraca. The species was described by Michael Fugate in 1993 based on specimens collected on Del Mar Mesa, San Diego County, California, by Fugate and Marie Simovich (Service 1994c). The San Diego fairy shrimp is closely allied with, and has historically been misidentified as *Branchinecta lindahli*, a species widely distributed in western North America. This species was first collected (but identified then as *B. lindahli*) near Poway and at Ramona, California in 1962 (Service 1994c).

The San Diego fairy shrimp was listed as endangered on February 3, 1997 (62 FR 4925), after the Service determined that the continued survival of the species was threatened by habitat destruction from agricultural and urban development, alteration of wetland hydrology by draining, off-road vehicle activity, cattle grazing, and replacement by other fairy shrimp species that are habitat generalist. The San Diego fairy shrimp is restricted to vernal pool habitat, which has been eliminated from approximately 97% of its former extent in southern California. This fairy shrimp is found almost entirely in San Diego County, ranging from Camp Pendleton Marine Base, inland to Ramona and south through Del Mar Mesa, Proctor Valley, and Otay Mesa into northwestern Baja California, Mexico. In Baja California, it has been recorded at two localities (Valle de Palmas and Baja Mar, north of Ensenada). A single isolated female individual has been reported from vernal pools in Isla Vista, Santa Barbara County, California (Service 1994c).

#### **Threatened Animal Species**

##### California red-legged frog

Red-legged frogs breed from November to March with earlier breeding records occurring in southern localities (Storer 1925). Females deposit egg masses on emergent vegetation such that the egg masses float on the surface (Hayes and Miyamoto 1984). Eggs hatch within six to 14 days. The most significant egg mortality factor is salinity within complete mortality for eggs

exposed to salinity levels greater than 4.5 parts per thousand (Jennings and Hayes 1990). Larvae undergo metamorphosis in 3.5 to 7 months and sexual maturity is reached at three to four years (Jennings and Hayes 1990; Storer 1925). Adults may live up to eight to ten years (Jennings *et al.* 1992).

Habitat for the red-legged frog is distinct in its aquatic and riparian elements (Hayes and Jennings 1988; Jennings 1988). The adults require dense riparian vegetation associated with deep still or slowly moving water (Jennings *et al.* 1992). Heavily vegetated, terrestrial riparian areas may provide important wintering habitat, as they estivate in small mammal burrows and

moist leaf litter within riparian vegetation up to 26 meters (85 feet) from water's edge (Rathburn *et al.* 1993).

The geographic range of the red-legged frog has been reduced by 75 percent (Jennings *et al.* 1992). Historically, the range of the California red-legged frog was from Point Reyes inland and northward to Redding and southward to Northwestern Baja California, Mexico.

Habitat loss and alteration are primary factors in the decline of the red-legged frog. Wetland alterations include stream channelization, vegetation clearing, water diversions, and reservoirs. Reservoirs have the added impact in that they support and are sometimes stocked with exotic predators such as fish, crayfish, and bullfrogs. An additional indirect impact of development within the riparian corridor is increased siltation that can smother eggs and larvae.

Livestock grazing and off-road vehicle activities have also contributed to red-legged frog decline. Grazing contributes to the sedimentation and erosion into riparian and aquatic habitats (Lusby 1970; Winegar 1977; Jennings *et al.* 1992). Cattle often concentrate in riparian areas during the dry season (Marlow and Pogacnik 1985). Cattle will reduce or eliminate riparian and emergent vegetation by trampling and/or browsing (Gunderson 1988, Duff 1979). Additionally, removal of vegetation can raise water temperature levels and promote bullfrog breeding. Off-road vehicle use impacts red-legged frogs similarly to livestock grazing by damaging riparian vegetation and increasing siltation and erosion.

Currently, red-legged frogs are known from about 190 streams or drainages in 15 counties in central and southern California. In southern California, only four population localities are currently extant as compared with more than 80 historic locality records. This subspecies has been extirpated from San Diego County. The red-legged frog was listed as threatened on May 23, 1996 (61 FR 25813) due to past decline and current threats, including urban encroachment, reservoir construction, water diversion, and introduced predators and competitors.

#### Coastal California anacatcher

The coastal California gnatcatcher (gnatcatcher) is a recognized subspecies of the California gnatcatcher (*Polioptila californica* [Brewster]) and is endemic to coastal southern California and

northwestern Baja California, Mexico (American Ornithologists' Union 1983, 1989; Atwood 1980, 1988, 1990, 1991). It is a nonmigratory, resident species which is found on the coastal slopes of southern California, ranging from southern Ventura County, the Palos Verdes Peninsula in Los Angeles County southward through Orange, western Riverside, western San Bernardino, and San Diego counties into Baja California, Mexico to approximately 30 degrees North latitude near El Rosario (American Ornithologists' Union 1957; Atwood 1980, 1990; Phillips 1991; Banks and Gardner 1992).

The gnatcatcher was federally listed as threatened on March 30, 1993 (58 FR 16742). On December 10, 1993, pursuant to section 4(d) of the Endangered Species Act, the Service defined



specific conditions associated with certain land-use activities under which incidental take of the gnatcatcher and CSS habitat would not be a violation of section 9 of the Act (58 FR 65088).

The gnatcatcher typically occurs in or near sage scrub habitat, although it also uses to a much lesser extent chaparral, grassland, and riparian habitats where they occur adjacent to sage scrub habitat. While actual quantitative data may reveal relatively little use of other habitats, they may be critical during certain times of year for dispersal or as foraging areas during drought conditions. Breeding territories have also been documented in non-sage scrub habitat. Coastal sage scrub plant species are typically low-growing, drought-deciduous shrubs and sub-shrubs. Succulent plant species are also represented. Shrub species that typically dominate this habitat include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), sage (*Salvia* spp.), laurel sumac (*Malosma laurina*), lemonadeberry (*Rhus integrifolia*), California encelia (*Encelia californica*), goldenbush (*Isocoma* spp.), and cactus (*Opuntia* spp.) (Munz 1974; Kirkpatrick and Hutchinson 1980). Sage scrub often occurs in a patchy, or mosaic, distribution and patch size varies throughout the range of distribution for the gnatcatcher.

The gnatcatcher is primarily insectivorous and defends territories ranging in size from approximately 2 to 40 acres (Atwood 1990). Although gnatcatchers use a diverse range of plant species within sage scrub (Braden and Love 1995), quantitative data on bird densities relative to vegetation sub-associations are lacking. However, information suggests that small-scale differences in plant composition and/or structure may help explain discontinuities in gnatcatcher occurrence (Raabe 1995; Weaver 1995). Breeding birds have reached densities as high as one pair per five acres, but this is highly variable, with often more than 16 acres required per pair (Matson 1978, Atwood 1980, James 1993, Lovio 1993, unpublished data). Areal use requirements by gnatcatchers vary throughout the year with territorial behavior relaxing somewhat in the non-breeding season, which is often accompanied by an expansion in the area of use. These non-breeding areas are about 70 percent larger than breeding territories (Deeley 1996; Preston et. al. 1996).

Comprehensive studies by Atwood (1988, 1991), along with his 1990 status review of the gnatcatcher, have identified the extremes of the breeding season as being between February and August, although reproduction is concentrated in April and May. Clutch sizes range between three or four eggs, with the average egg number generally being four. Juvenile birds associate with their parents for several weeks (up to months) after fledgling and may disperse together in search of new territories (Woods 1921, Bent 1949). Gnatcatchers are persistent nest builders and often attempt multiple broods which is suggestive of a high reproductive potential. This is, however, offset by high rates of nest predation and brood parasitism. Gnatcatchers typically live for two to three years, although ages of up to five years have been recorded for some banded birds.

Multiple-year monitoring studies have provided preliminary data on local population dynamics. Pair numbers fluctuate significantly, even between consecutive years, and the magnitude of

fluctuations can exceed 100% (Erickson and Pluff 1995; Woehler et al. 1995). The underlying causes of these population fluctuations are complex and, as a result, not easily identified, but suggest that some local gnatcatcher populations may not be at saturation. Dramatic population changes (mostly increases) which have been documented since the end of the 1980's have been attributed to reproductive responses by gnatcatchers to variations in productivity of the sage scrub vegetation as mediated by climatic conditions, particularly rainfall (Woehler et al. 1995). Although plausible, this theory has not been rigorously tested. Additionally, monitoring of gnatcatcher reproduction performed at the Irvine Ecological Preserve from 1991-1995 documented a progressive increase in reproduction that corresponded with the end of a prolonged drought (Woehler et al. 1995). Although the direct link between rainfall and reproductive output has yet to be strongly supported by long-term data, the observed increase was corroborated by monitoring studies in other areas (Ogden 1993). Other local population increases correspond to spatial shifts following large-scale habitat loss or disturbance in surrounding landscapes, suggesting refugial use (Woehler et al. 1995). Despite the availability of refugia, however, the mortality resulting from catastrophic events (such as fire) may be protracted as studies reveal these abrupt population increases to be temporary, indicating an adjustment to carrying capacity.

Monitoring studies have collected reproductive data such as fledgling success in local gnatcatcher populations. The gnatcatcher may have productivity levels similar to that of other small songbird species, but the inter-year variability is relatively high (Ogden 1993). Productivity in terms of fledglings per breeding pair ranged from 2.6 to 4.8 in four studies conducted in various areas between 1992 and 1995 (Andros and Schroeder 1995; Atwood et al. 1995; Braden et al. 1995a; Galvin et al. 1995). These numbers indicate that some of the local gnatcatcher populations produce offspring at numbers exceeding the size of the breeding population in any given year (Woehler et al. 1995), however, productivity must be considered relative to mortality, which remains essentially unmeasured.

Although observed declines in numbers of gnatcatcher result from numerous factors, habitat destruction, fragmentation and adverse modification are the principal reasons for the gnatcatcher's current threatened status (58 FR 16742). Up to 90 percent of coastal sage scrub vegetation has been lost as a result of development and land conversion (Westman 1981a, 1981b; Barbour and Major 1977), and coastal sage scrub is considered to be one of the most depleted habitat types in the United States (Kirkpatrick and Hutchinson 1977, Axelrod 1978, Klopatek et al. 1979, Westman 1987, O'Leary 1990). In addition to agriculture and urbanization, the documented increase in fire frequency is also an important factor threatening the gnatcatcher in that it can render large areas of CSS unusable by birds for periods of several years, thus exacerbating the effects of habitat fragmentation. Frequent fires in a given area can also encourage invasion by exotic vegetation and can lead to habitat type-conversions.

Once considered to be a common species (Grinnell and Miller 1944), the gnatcatcher persists as a greater population of numerous, isolated sub-populations of different sizes within essentially the original confines of its range. The overall size of the greater population,

however, is assumed to have been reduced in proportion to the historical loss of the CSS

vegetation. The most current assessments of total population size of the gnatcatcher conservatively estimate 3500 birds remaining in the United States portion of the range. Approximately 2100 pairs occur within San Diego County (USFWS 1996).

## **Endangered Plant Species**

### San Diego button celery

*Eryngium aristulatum* var. *parishii* is a low, spreading or ascending perennial herb that is endemic to claypan and hardpan vernal pools between southwest Riverside County and northwestern coastal Baja California. In San Diego County it is known from Camp Pendleton, San Marcos, Otay Mesa, Miramar area, and Kearney Mesa. Although locations are widespread, many local populations are small remnants of the former extent and are largely still at risk of destruction. Threats include urbanization, agriculture, and off-road vehicle use. The button celery was listed as endangered on August 3, 1993 (58 FR 41384).

### California Orcutt grass

*Orcuttia californica* is a member of the grass family (Poaceae). This small annual grass reaches about 10 centimeters (four inches) in height, is bright gray-green, and secretes sticky droplets that taste bitter. Inflorescences, borne from May through July, consist of seven spikelets arranged in two ranks, with the upper spikelets overlapping on a somewhat twisted axis.

Orcutt grass was listed as endangered on August 3, 1993 (58 FR 41391) after the Service determined that the present range and continued existence of the species was being rapidly destroyed by habitat loss and degradation due to urban and agricultural development, livestock grazing, off-road vehicle use, trampling, invasion from weedy non-native plants and other factors.

*Orcuttia californica* is endemic to vernal pool habitat, which is estimated to have been eliminated from approximately 97% of its former extent. This species has been reported from at least four locations in Los Angeles County. However, it is currently known from only a single locality near Santa Clarita, California (Curzan Mesa). An occurrence has been reported near Woodland Hills in Ventura County (93 FR 18432; pers. comm. to E. Bauder). It is also known from the Santa Rosa Plateau, Skunk Hollow and a site near Hemet (D. Bramlet unpublished data). It once occurred near Murrieta Hot Springs, but the population has been extirpated. In San Diego County, *O. californica* is found in two pools on Naval Air Station Miramar, near Carlsbad (in the same pool as *Eryngium aristulatum* var. *parishii*), and in a two small pool groups on Otay Mesa. In Baja California, Mexico, *O. californica* has been found on Mesa de Colonet and in pools at San Quintin. Both these sites still have, *O. californica*.

### San Diego Mesa Mint

*Pogogyne abramsii* is an annual herb in the mint family (Lamiaceae). The genus *Pogogyne* was first described by Bentham (1834 cited in Howell 1931) in his monographic study of the mint family, *Labiatarum Genera et Species*. John Thomas Howell (1931), in his monographic study of the genus *Pogogyne*, separated *P. nudiuscula* into two species: *P. nudiuscula* and *P. abramsii*. *Pogogyne abramsii* was diagnosed by hairs on the calyx and a different bract morphology from *P. nudiuscula*. Not only do the two species differ in the calyx pubescence and bract morphology, but also in the number of flowers per stem node. A major problem in determining the original range of these two species is that almost all of the herbarium collections that might prove useful are very vague on locality. Their sites are given as "mesas, San Diego"; "San Diego"; and "mesas near San Diego". *P. abramsii* can still be considered as all the current *Pogogyne* populations north of Mission Valley and south of Del Mar Mesa. The populations from the central mesa were probably *P. abramsii*, but with such limited herbaria records, this question will probably never be fully resolved.

As an herbaceous annual, *Pogogyne abramsii* occasionally reaches about a foot in height and blooms from about May to early July. Flowers are insect-pollinated and in areas surrounded by development and disturbance, the introduced honey bee (*Apis mellifera*) is a common pollinator. In areas of lower disturbance, the honey bee can often be replaced by bee flies (Bombyliidae), flower flies (Syrphidae) or ground dwelling bees (Anthophoridae)(Ellis and Mills 1991; McMillan unpublished data).

*Pogogyne abramsii* was listed as endangered on September 28, 1978 (43 FR 44812), after the U.S. Fish and Wildlife Service (Service) determined that the present range and continued existence of the species was being rapidly destroyed by highway construction, housing development, off-road vehicle use, illegal dumping, and agricultural conversion. It is known to exist on the coastal mesas in central San Diego County. Its northern range boundary is Del Mar Mesa, and it occurs south on Mira Mesa, Naval Air Station Miramar, and Kearney Mesa with a few populations in western Tierrasanta. *P. abramsii* populations were extirpated from the Linda Vista area, the vicinity of Balboa Park, Normal Heights, and the area surrounding San Diego State University. Most of these extirpated populations from the San Diego Mesa are labeled as *P. nudiuscula* on herbarium collections, however, these specimens have not been annotated and should be considered *P. abramsii* (S. McMillan, SDSU, unpublished data).

### Otay Mesa Mint

*Pogogyne nudiuscula* is an annual herb in the mint family (Lamiaceae). Howell considered *P. nudiuscula* to be diagnosable from *P. abramsii* by having a glabrous calyx and bract with a different morphology. This is supported by current work (Jokerst 1993; McMillan unpublished data), and the species is also diagnosable by usually having at least six flowers per node on the stem.

*Pogogyne nudiuscula* can reach 30 centimeters (one foot) in height or more and blooms from May through June or early July. The plant is usually not very branched, and the vegetative and floral portions of the plant give off a strong, turpentine mint odor. Flowers are insect-pollinated and in areas surrounded by development and disturbance, the honey bee may be the most common pollinator. In areas of lower disturbance, honey bees can often be replaced by numerous types of butterflies (Lepidoptera) and more commonly, bee flies (Bombyliidae) and flower flies (Syrphidae) (McMillan unpublished data).

*Pogogyne nudiuscula* was listed as endangered on August 3, 1993 (58 FR 41391), after the Service determined that the present range and continued existence of the species was being rapidly destroyed by habitat loss and degradation due to urban and agricultural development, livestock grazing, off-road vehicle use, trampling, invasion from weedy non-native plants and other factors.

*Pogogyne nudiuscula* currently exists only in a small number of pools on Otay Mesa. Historically it was known to occur across the United States International border where the Tijuana International Airport is now located. No Tijuana populations of *P. nudiuscula* are known to exist today. *P. nudiuscula* was never known to occur further north than Otay Mesa (see explanation above).

Arctostaphylos glandulosa ssp. crassifolia (Del Mar manzanita)

The Del Mar manzanita is a white-flowered shrub that grows near the coast in southern maritime chaparral. This species is threatened by habitat destruction and fragmentation from agricultural, residential, and commercial development and fuel modification activities and was federally listed on October 7, 1996 as endangered (61 FR 52370). About 21,000 acres of southern maritime chaparral historically occurred in San Diego County (Oberbauer and Vanderwier 1991). Currently, about 2,500 acres of this habitat remain in the County (Oberbauer and Vanderwier 1991), representing a 90 percent reduction that is largely due to agricultural conversion and urbanization. Roberts (1993) estimated that about 88 percent of the remaining southern maritime chaparral in San Diego County contains Del Mar manzanita.

Del Mar manzanita is restricted to sandstone terraces and bluffs from Carlsbad south to Torrey Pines State Park, extending inland to Rancho Santa Fe and Del Mar Mesa in San Diego County, California. An additional population has been reported just south of the San Dieguito River southwest of Lake Hodges in San Diego County. This species has also been reported from five localities in northwestern Baja California, Mexico, from just east of Tijuana along the United States border to Cerro el Coronel and Mesa Descanso about 31 miles north of Ensenada.

The majority of Del Mar manzanita populations are located in the United States. Twenty-six weakly defined populations have been identified in San Diego County. The majority of these populations occur within four miles of the coast. In 1982, it was estimated that there were about 15,300 to 16,500 individuals of this species distributed within 314 distinct stands. A stand may

represent from a single individual to as many as 500 individuals, and may cover up to 15 acres. The average stand is generally less than 2 acres in size, and contains 20 to 60 individuals. Other populations existed prior to 1982; however, these were not quantified before destruction. The 1982 figures likely reflect two-thirds to three-quarters of the historical extent of this species.

While 25 of the 26 populations in San Diego County are still extant, the majority of these populations have been greatly reduced and significantly fragmented by urban development since 1982. In the last decade, the species has suffered a 40 percent decline in the number of stands and over a 50 percent decline in the number of individuals. Currently, it is estimated that there are about 7,500 to 8,700 individuals remaining in San Diego County. A total of 197 stands remain, although the majority of these are distributed in fragmented habitat along the margins of residential development (Roberts 1993).

#### Chorizanthe orcuttiana (Orcutt's spineflower)

*Chorizanthe orcuttiana* a low, yellow-flowered annual of the buckwheat family (Polygonaceae), is restricted to sandy soils. Historically, *Chorizanthe orcuttiana* is known from 10 separate occurrences in San Diego County from Point Loma, Del Mar, Kearney Mesa, and Encinitas (CDFG 1992). Only two populations have been seen in recent years, one at Torrey Pines State Park and one in a City park in Encinitas. The Torrey Pines populations has not been relocated in the past few years possibly due to a changing composition of plant species and density after a 1984 burn. The population in Encinitas numbers nearly 1,500 individuals within an area of about 4 square meters. This population is threatened by proposed construction of recreational facilities. Due to their restricted distribution and small population size, *Chorizanthe orcuttiana* is also threatened with extinction by stochastic events. Genetic variability is reduced in small populations, making them vulnerable to extinction by a single human-caused or natural event such as drought or fire. *Chorizanthe orcuttiana* was federally listed as endangered on October 7, 1996 (61 FR 52370). A detailed account of the status, distribution, taxonomy, ecology, and reproductive characteristics of the species is presented in the final rule, which is hereby incorporated by reference.

#### **Threatened Plant Species**

##### Baccharis vanessae (Encinitas baccharis)

*Baccharis vanessae*, a member of the aster family (Asteraceae), is a dioecious, broom-like shrub associated with dense mixed chaparral. As currently understood, the historical distribution of this species included 18 populations scattered from the San Mateo Wilderness of northern San Diego County, California, south to Encinitas east through the Lake Hodges area to Mount Woodson and south to Poway and Los Penasquitos Canyon. Twelve of these populations are still extant and contain approximately 2,000 individuals. With the addition of recently discovered populations, fourteen populations currently exist. Four of these contain fewer than six individuals. Seven of the remaining fourteen populations are threatened by development.

The imminent threat facing this taxon and its associated habitats is the ongoing and future destruction and adverse modification of habitat by urban and agricultural development, recreational activities, trampling, and fuel modification activities. Due to their restricted distribution and small population size, *Baccharis vanessae* is also threatened with extinction by stochastic events. Genetic variability is reduced in small populations, making them vulnerable to extinction by a single human-caused or natural event such as drought or fire.

*Baccharis vanessae* was federally listed as threatened on October 7, 1996 (61 FR 52370). A detailed account of the status, distribution, taxonomy, ecology, and reproductive characteristics of the species is presented in the final rule, which is hereby incorporated by reference.

## PROPOSED PLANT SPECIES

### Acanthomintha ilicifolia (San Diego thornmint)

*Acanthomintha ilicifolia* is an annual aromatic herb of the mint family (Lamiaceae). Thornmint usually occurs on heavy clay soils within open patches of coastal sage scrub, chaparral, and native grassland of coastal San Diego County and south to San Telmo in northern Baja California, Mexico. This taxon is considered to be "one of the most restricted clay soil endemics" (Oberbauer 1991). It is frequently associated with gabbro soils derived from igneous rock, and it also occurs in calcareous marine sediments.

About 40 percent of the known 35 historic populations in the United States have been extirpated. Currently, about 40,000 individuals are distributed over 20 sites ranging from San Marcos east to Alpine and south to Otay Mesa in San Diego County (CNDDB 1995).

San Diego thornmint is currently proposed for Federal listing as endangered (60 Federal Register 40549). This species is threatened by development, agriculture, off-road activity, over collecting, stochastic extinction, trampling, and invasion of non-native species.

### Brodiaea filifolia (thread-leaved brodiaea)

*Brodiaea filifolia*, a perennial, is a member of the lily family (Liliaceae). This species typically occurs on gentle hillsides, valleys, and floodplains in mesic, southern needlegrass grassland and alkali grassland plant communities in association with clay, loamy sand, or alkaline silty-clay soils (CDFG 1981). Sites of occupation are frequently intermixed with, or near, vernal pool complexes, such as in the vicinity of San Marcos (San Diego County), the Santa Rosa Plateau, and southwest of Hemet (Riverside County). Twenty-seven populations of this species are known to exist. The majority of the remaining populations are located on the Santa Rosa Plateau in southwestern Riverside County, and in the Vista-San Marcos-Carlsbad region of northwestern San Diego County. Nearly half of the latter population has been eliminated. Over the last 15 years, nearly 60 ha of occupied habitat containing over 80,000 plants have been eliminated in the cities of San Marcos and Vista. While the largest population on the Santa Rosa

Plateau is on

land owned by The Nature Conservancy, all other extant populations are on privately owned land. This species is threatened by habitat destruction, degradation, and fragmentation resulting from agriculture, urbanization, pipeline construction, alteration of wetland hydrology by draining or channelization, clay mining, off road vehicles, weed abatement, and encroachment by exotic plant species.

A detailed account of the status, distribution, taxonomy, ecology, and reproductive characteristics of the thread-leaved brodiaea is presented in the proposed rule to list this species as threatened (59 FR 64812) which is hereby incorporated by reference.

Hemizonia conjugens (Otay tarplant)

*Hemizonia conjugens* is an aromatic annual of the sunflower family (Asteraceae). This taxon is restricted to clay soils in coastal sage scrub and grassland habitats. In San Diego County, by 1991, an estimated 95 percent of the native perennial grasslands and 60 percent of coastal sage scrub had been lost to development (Oberbauer and Vanderwier 1991, San Diego Association of Governments 1995). This species currently has a very limited distribution consisting of 15 populations near Spring Valley in southern San Diego County and one population in Baja California, Mexico. It is threatened by variety of factors including urban and agricultural development, competition from non-native plant species, off-road vehicles, mining, grazing, and trampling by hikers. Due to these threats, *Hemizonia conjugens* has recently been proposed for Federal listing as endangered (60 FR 40549). Two of the major populations, containing about 70% of all known individuals, are within proposed development projects that would fragment the remaining habitat. The five remaining major populations (containing about 25% of all individuals) may be subject to edge effects.

Monardella linoides ssp. viminea (willowy monardella)

*Monardella linoides* ssp. *viminea* is a perennial herb of the mint family (Lamiaceae) that often grows in sandy washes and floodplains. This taxon was previously known from 27 occurrences in the United States. Approximately 6,000 individuals of this species from 20 populations are thought to be extant in the United States. All but one population of approximately 200 individuals occur between Penasquitos Canyon and Mission Gorge in San Diego County. Fifteen populations have fewer than 100 plants, and 6 of these contain fewer than 15 individuals. One population is known from northern Baja California, Mexico. The remaining populations are threatened by urban development, sand and gravel mining, off-road vehicles and fire. Due to these threats, *Monardella linoides* ssp. *viminea* was proposed for Federal listing as endangered (60 FR 40549).

Navarretia fossalis Moran (spreading navarretia)



*Navarretia fossalis* is a low, mostly spreading or ascending, annual herb in the phlox family (Polemoniaceae). This plant species was proposed for listing as threatened on December 15,

1994 (59 FR 64812) after the Service determined that *Navarretia fossalis* was declining as a result of habitat destruction and fragmentation from agricultural development, pipeline construction, alteration of wetland hydrology by draining or channelization, off-road vehicle activity, cattle and sheep grazing, weed abatement, fire suppression practices, and competition from alien plant species. *N. fossalis* is known from widely disjunct and restricted populations extending from the Santa Clarita region of Los Angeles County, east to the western lowlands of Riverside County, south through coastal and foothill San Diego County south to San Quintin, Baja California, Mexico. Fewer than 30 populations exist in the United States. Nearly 60 percent of these populations are concentrated in three locations: on Otay Mesa in southern San Diego County, along the San Jacinto River in western Riverside County, California, and near Hemet in Riverside County (Service 1994b).

In San Diego County, *Navarretia fossalis* appears to be a vernal pool endemic. In Riverside County, *N. fossalis* has been found in relatively undisturbed and moderately disturbed vernal pools and within larger vernal wetland plains near Hemet that are dominated by alkali grassland. The species also occurs in alkali playa habitats along the San Jacinto River.

#### *Nolina interrata* (Dehesa beargrass)

*Nolina interrata* is a member of the lily family (Liliaceae) and is restricted to clay soils formed from gabbro soils. This species grows in chaparral habitat commonly associated with *Adenostoma fasciculatum* (chamise) and *Salvia clevelandii* (Cleveland sage). The total population size of *Nolina interrata* is about 9,000 plants. There are nine populations in San Diego County, all within a 6 square mile area in the Dehesa Valley east of El Cajon, California. There are no records of extirpated populations. About one-third to one-half of the known populations are protected on a reserve managed by The Nature Conservancy. Another large population near Sycuan Peak has become part of a state-managed preserve. The remaining populations are all on private land. *Nolina interrata* is also known from two to three populations in Mexico, each with fewer than 25 individuals. This species is threatened by habitat destruction, degradation, and fragmentation resulting from urbanization, encroachment by exotic plant species, and disruption of a normal fire cycle. *Nolina interrata* was recently proposed for Federal listing as threatened (60 FR 51443).

#### EFFECTS OF THE ACTION

Implementation of the Fire Chiefs' vegetation abatement plans through participation in an MOU and issuance of an incidental take permit may adversely affect listed and proposed species in San Diego County. Within the Multiple Species Conservation Program (MSCP) and Multiple Habitat Conservation Program (MHCP) planning areas of San Diego County (subregions of the statewide NCCP program), approximately 2,876 acres out of 697,374 acres of natural habitats lie

within 100 feet of existing development (SANDAG Analysis). Within the eastern portion of San Diego County, approximately 867 acres out of 915,674 acres of natural habitats lie within 100 feet of structures (County of San Diego, 1996). Thus, an estimated 3,743 acres out of 1,613,048

acres of natural habitat (0.2%) lies within 100 feet of existing structures within San Diego County.

There are inadequate data on the distribution of listed and proposed species in proximity to existing human development at the scale of the entire county to support a numerical assessment of the proposed action on each species. Rather, this assessment is based on the narrow, linear, and peripheral nature of the proposed action.

In general, impacts resulting from vegetation removal activities are limited to narrow strips (typically 100 feet wide or less) along the urban/wildland interface. Impacts of fuelbreak creation and maintenance could include direct take such as killing or injuring individuals, or damaging plants that are present within the firebreak area. Fuelbreak creation could also result in habitat destruction and fragmentation and in harassment from actions involving vehicle access, human activity, and noise from vegetation clearing activities. Edge effects could increase due to an increase in the rate of introduction of weedy species, or by allowing easier access by predators and humans. Hydrology could be changed, affecting certain plant species and the animals dependent on affected plants. Territorial animals that must disperse to other areas or are forced to condense the size of a territory may have a decreased chance of becoming reproductively successful. If a displaced individual or pair disperses into the remaining areas of habitat, it may cause increased stress on the existing inhabitants. Territories may have to be more vigorously defended and territory boundaries may shift, ultimately affecting reproductive success.

Those species occurring in the most abundant vegetation communities along the wildland-urban interface would likely be affected most often by fuelbreak construction. The acreages of vegetation communities potentially affected along the existing interface throughout San Diego County was estimated by the San Diego Association of Governments (SANDAG), utilizing various city and county Geographic Information System (GIS) habitat databases. Due to limitations in small-scale interpretation of the databases (the GIS calculations could not distinguish portions of the interface with currently adequate fuelbreaks or which otherwise would not require vegetation clearance), a correction factor was necessary to account for over-estimations of natural habitats potentially lost to fuelbreaks. For lack of a better criterion for this adjustment, the correction factor was determined from the proportion of compliance with fuelbreak requirements on undeveloped lands (not restricted to native vegetation) in a sample fire district.

### **Vernal Pool Species**

Seven federally listed or proposed species primarily restricted to vernal pools could be affected

by implementation of the vegetation abatement MOU: San Diego button-celery, spreading navarretia, California Orcutt grass, San Diego mesa mint, Otay mesa mint, San Diego fairy shrimp, and Riverside fairy shrimp. Although not quantified, some vernal pools may occur within 100 feet of occupied structures that may require fuel modification. However, the vegetation found in vernal pools is diminutive in size, and provides very little fuel, even in the

driest of conditions. Although not specifically addressed in the terms of the MOU, vernal pools have historically been avoided in the course of fuel management due to the small fuel loads within pools. However, because the pools are sometimes located within larger areas requiring fuel modification, some impacts may occur. Potential impacts to vernal pool species include trampling of plants and fairy shrimp if individuals enter the pools on foot. Additional impacts could result from vehicular access to pools.

The Service will make available to the Fire Chiefs and Fire Districts information about the location of any vernal pools within 100 feet of existing development. The fire departments will avoid clearing in vernal pools. To further reduce potential impacts to vernal pools, only hand-clearing methods will be used to remove flammable vegetation that occurs within 50 feet of a vernal pool. If an impact is determined to be unavoidable, the Fire Chiefs and Fire Districts will coordinate with the Service and the Department.

Due to avoidance of direct impacts and utilization of only hand clearing methods within 50 feet of vernal pools, impacts to vernal pool species will be avoided during implementation of the MOU.

### **Riparian Species**

Although some riparian habitat lies within 100 feet of existing structures in San Diego County, vegetation abatement for purposes of fire protection has traditionally been unnecessary in riparian areas due to the relatively non-flammable nature of the vegetation.

### **Birds**

The least Bell's vireo and southwestern willow flycatcher could be adversely affected by the implementation of the MOU in the event that vegetation management zones overlap with riparian habitat. Removal of nesting substrate could reduce available nesting areas for vireos or flycatchers or even cause direct take of nestlings if such activities occur during the nesting season. Harassment of birds inhabiting areas subject to vegetation removal or adjacent to such areas could also occur. However, it is the Service's opinion that, based on the avoidance of riparian habitat in fuel management, effects to riparian bird species as a result of this permit would likely be limited to harassment, such as from noise or dust from nearby activities, or harm resulting from reduction in adjacent upland foraging areas. Such effects are not likely to jeopardize least Bell's vireo or southwestern willow flycatcher. Direct killing of, or injury to, individual animals would be limited to accidental injury or death of animals that are temporarily utilizing upland areas. Further avoidance is anticipated by the lack of seasonal overlap between most anticipated

vegetation removal (late winter and early spring) and the occurrences of these migratory riparian birds (spring and summer).

### **Amphibians**

Adults, tadpoles, and eggs of southwestern arroyo toads and red-legged frogs could be adversely affected by reduction of riparian vegetation, which could result in changes in water temperatures. Southwestern arroyo toads are water-dependent breeders, but also use adjacent upland habitat within one kilometer of water sources for up to ten months of the year. In upland areas subject to vegetation abatement, toads may be vulnerable to take for a brief period if their seasonal emergence from hibernation coincides with fuelbreak construction, but the nocturnal habits of this species will likely serve to minimize this possibility. It is also possible that toads may be effected in their upland phase by loss of protective cover, destruction of burrows, and mortality from crushing. Quantification of the number of toads or acreage of habitat potentially affected was not possible at the time of this analysis. It is the Service's opinion that the effects of the proposed action on red-legged frogs and southwestern arroyo toads will be minimal because: a) this opinion and the MOU provide for avoidance of riparian habitat types in fuel management; b) information on the arroyo toad suggests that upland habitat use is concentrated mostly in the more friable soils of alluvial terraces; c) few dwellings exist within or near such peripheral uplands on known arroyo toad drainages (USFWS 1994); d) fuelbreak construction activities will be restricted to surface vegetation for the protection of soil integrity; and e) there are no known extant populations of red-legged frogs in San Diego County.

### **Coastal Sage Scrub Species**

Implementing vegetation abatement programs could affect hundreds of acres of coastal sage scrub and species associated with this vegetation community. The SANDAG and San Diego County GIS calculations determined that approximately 220,000 acres of coastal sage scrub occur in the county. Based on the SANDAG analysis, 745 acres of CSS will potentially be affected by fuelbreak construction.

#### **California Gnatcatcher**

Approximately 2,100 California gnatcatcher pairs have been estimated to reside in San Diego County. The California gnatcatcher inhabits coastal sage scrub areas that could be affected by the implementation of vegetation abatement activities. Disturbances to the gnatcatcher from the proposed activity are expected to occur in peripheral areas of the birds' territories, which will be rendered unusable for all or most life-history activities. Disturbance of this habitat strip will reduce the overall carrying capacity of coastal sage scrub areas and may affect the gnatcatcher through increased density of birds, reduction of

territory size, increased territorial defense behavior, and direct harassment from abatement activities. The Service has no direct measure of the number of gnatcatcher pairs that utilize the peripheries of CSS areas for nesting, foraging, or sheltering and which therefore will be subject to harm or harassment by vegetation removal. However, it is assumed that the number of pairs affected will be proportional to the estimated 745 acres of CSS habitat expected to be impacted by the proposed action. The effects to gnatcatchers resulting from 100-foot wide fuelbreaks is likely to be minimal, though, because the area of the firebreaks in most instances will represent only a small fraction of any single gnatcatcher territory and because the overall gnatcatcher densities and habitat quality at the edge of existing development are assumed to be lower than in the interiors of habitat stands. Because the California gnatcatcher is a sedentary species that occupies the same general area throughout the year, it is assumed that birds will not be able to compensate for home range area lost to vegetation removal. The gnatcatcher's requirement for at least moderate CSS vegetation structure will prevent it from finding suitable nesting habitat in regularly maintained vegetation removal zones. Fuel management zones that have not been cleared for several years may have CSS and gnatcatchers present, so established fuelbreaks should be maintained regularly within 3-year periods to prevent the recovery of CSS and potential further impacts to gnatcatchers.

Because the nesting season of the California gnatcatcher extends from early February through August, and nests are constructed in a variety of shrubs of the coastal sage scrub vegetation between 90 and 105 cm off of the ground, it is assumed that gnatcatchers may be harmed and harassed as a result of proposed activities and more rarely may be killed or injured. The timing of abatement activities could add to the adverse impact on California gnatcatcher. For example, abatement of vegetation during the gnatcatcher breeding season may have greater adverse effects on the species than abatement during the nonbreeding season.

Loss of CSS, disturbed CSS, and CSS/grassland through fire abatement activities will be monitored on an annual basis. The Service is involved in the State of California's Natural Community Conservation Planning (NCCP) program through the rule under section 4(d) of the Endangered Species Act associated with the threatened listing of the gnatcatcher. This special rule allows approval of projects of low impact in the interim period before specific subarea preserve plans are finalized under the NCCP framework, so long as cumulative losses do not exceed 5% of the remaining CSS and project approval does not preclude long-term preserve plans. Under NCCP guidelines, jurisdictions must track the cumulative acreage of CSS loss, including fuelbreaks, to monitor the allocation of the 5% interim allowance. To this end, the Service, Fire Districts, and Fire Chiefs will develop an effective tracking method for the loss of CSS from fuelbreak clearing. CSS lost due to vegetation abatement activities will be counted towards the allowable 5% loss until subarea preserve plans are finalized. However, such loss of CSS will be exempt from mitigation requirements of the NCCP in accordance with a special statement issued by the Department and Service on February 2, 1995. Vegetation abatement activities will be

considered in the development of subarea preserve plans.

The cutting, mowing or discing and subsequent maintenance of fuel breaks could result in the harm, harassment, and even the destruction of individual coastal California gnatcatchers. However, it is the Service's opinion that the impacts described above are

not likely to jeopardize the continued existence of the gnatcatcher for the following reasons:

1. Much of the CSS that may be disturbed or destroyed in the course of vegetation abatement around structures will be unoccupied or will be peripherally occupied by gnatcatchers.
2. The implementation of vegetation abatement will in some instances reduce the risk of wildland fire consuming extensive amounts of wildlife habitat. As large blocks of suitable habitat for gnatcatchers diminish and the extent of the urban-wildland/interface increases, fire management including vegetation abatement will become a more critical element in conservation planning and reserve management.
3. The estimated 745 acres of gnatcatcher habitat potentially affected by implementation of vegetation abatement programs is within the maximum allowable 5% CSS loss under the 4(d) rule.

### **Mountain Meadow Species**

#### **Laguna Mountains skipper (*Pyrgus ruralis lagunae*)**

The Laguna Mountains skipper is found in several mountain meadows in the Laguna and Palomar Mountain ranges of San Diego County. Effects to the skipper potentially resulting from the construction and maintenance of firebreaks include direct death or injury to the early stages, damage or loss of food plants and adult nectar sources, and harassment of the adults. Quantification of the number of Laguna Mountain skippers or acreage of habitat potentially affected was not possible at the time of analysis. However, much of the meadow habitat utilized by the Laguna Mountains skipper is in areas where structures are limited and should not require clearing.

It is the Service's opinion that the potential adverse impacts described above are not likely to jeopardize the continued existence of the Laguna Mountains skipper because much of the meadow habitat where this species occurs is not likely to contain structures that require creation of fuelbreaks.

### **Grassland Species**

### **Stephens Kangaroo Rat**

The effects of the proposed action on SKR will be small to non-existent. There are few structures in the portion of San Diego County occupied by SKR, so little clearing will be done as outlined in the MOU in SKR habitat. SKR distribution is concentrated in Riverside County, and most of the habitat in San Diego occurs on Federal and rural lands not affected by this MOU.

### **Quino checkerspot butterfly**

The Quino checkerspot butterfly inhabits grasslands and ecotones between grasslands and coastal sage scrub, chaparral, and sparse native woodlands. Adverse impacts to the butterfly potentially resulting from the construction and maintenance of firebreaks could include direct death or injury to the early stages, damage or loss of food plants and adult nectar sources, harassment of the adults, and degradation of habitat which may result in increased invasive exotic vegetation. Quantification of the number of Quino checkerspot butterflies or acreage of habitat potentially affected was not possible at the time of analysis. However, checkerspot habitat is unlikely to occur near structures due to the prevalence of non-native plants and invertebrates in these areas.

It is the Service's opinion that the potential adverse impacts described above are not likely to jeopardize the continued existence of the SKR or quino checkerspot butterfly because much of the grassland and ecotone habitats where these species occur are not likely to occur near structures that require creation of fuelbreaks.

### **Narrow Endemic Species**

Because narrow endemics exist in small, disjunct populations that may be few in number, disturbance in a single area could have a large impact on the viabilities of these species. Narrow endemic species of San Diego County include: thread-leaved brodiaea, Pacific pocket mouse, Encinitas baccharis, Orcutt's spineflower, willowy monardella, San Diego thornmint, Olay tarplant, Del Mar manzanita, and Dehesa beargrass.

Because of the scope of the proposed fuel reduction activities addressed in the MOU, it is not presently possible to quantify the potential adverse impacts to these species. Populations of these species occurring within 100 feet of structures would be vulnerable to fuel modification activities. To reduce the likelihood of such effects, the MOU states that the Service and the Department will notify landowners subject to vegetation abatement of the presence of listed or proposed species within 100 feet of their structures so that they may be avoided if possible. The Service and the Department will also address these species during the annual coordination with the Fire Chiefs and Fire Districts.

It is the Service's opinion that the potential adverse impacts described above are not likely to jeopardize the continued existence of narrow endemic species of San Diego for the following reasons:

1. Existing populations of narrow endemics will be identified by Service and Department surveys.
2. The landowner notification protocol will allow salvage or avoidance of populations of narrow endemic species that lie within 100 feet of structures.

### CUMULATIVE EFFECTS

Cumulative effects include the impacts of future State, local or private actions that are reasonably certain to occur in the action area considered in this biological and conference opinion. Future federal actions that are unrelated to the proposed action are not considered cumulative to the proposed action because they require separate consultation pursuant to section 7 of the Act.

The majority of activities anticipated to affect these species within the foreseeable future are local urban development projects with no federal involvement. Local urban development is expected to be a continued impact because population growth analyses and estimates published by the Southern California Association of Governments (SCAG) for the 2010 and 2030 time horizons show substantial increase in the human population in the region. A large number of projects that lack a federal nexus are occurring or are proposed within the current range of the listed species addressed in this biological opinion. Future development should incorporate the guidelines set forth in the Bates Bill, which directs future safety-related vegetation abatement and fire management activities to be contained within development footprints, or be consistent with the requirements of regional planning efforts. These requirements and their impacts should be adequately addressed in the NEPA and CEQA review and documentation of the future projects.

The vegetation abatement activities will occur within the boundaries of several ongoing planning efforts under the NCCP, including the Multiple Species Conservation Plan, generated as part of San Diego's Clean Water Program; San Diego Association of Government's Multiple Habitat Conservation Program; and the County of San Diego's Multiple-Habitat Conservation and Open Space Plan. These planning efforts address the cumulative effects of future development by designing regionally based habitat preserves that afford permanent conservation of the listed species addressed herein.

### CONCLUSION

After reviewing the current status of the listed or proposed species within the action area, environmental baseline effects of the MOU, and cumulative effects, it is the Service's biological



and conference opinion that participation in the MOU with the Fire Chiefs, Fire Districts, Department, and CDF is not likely to jeopardize the continued existence of the species addressed herein. In addition, no critical habitat designated for the least Bell's vireo or proposed for the southwestern willow flycatcher will be adversely modified or destroyed.

### INCIDENTAL TAKE STATEMENT

Section 4(d) and 9 of the ESA prohibit the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing,

trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or a private applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under ESA provided that such taking is in compliance with this Incidental Take statement.

The measures described below are nondiscretionary, and must be implemented by the Service and the parties to the MOU so that they become binding conditions in order for the exemption in 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service fails to require the San Diego Fire Chiefs and Fire Districts to adhere to the terms and conditions of the incidental take statement through the enforceable terms in the Memorandum of Understanding or fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Sections 7(b)(4) and 7(o)(2) of the ESA do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that the ESA requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

### **Amount or Extent of Take**

The Service anticipates the modification of approximately 745 acres of California gnatcatcher habitat as a result of fuelbreak creation. The Service anticipates that a number of California gnatcatchers commensurate with this amount of peripheral habitat loss may be harmed (in the

case of nestlings) or harassed as a result of fuel modification activities.

The Service anticipates that no arroyo toads will likely be killed, but that an unquantifiable number may be harmed or harassed as a result of fuel modification activities in upland habitats peripheral to toad breeding drainages.

The Service anticipates no take in the form of harm or killing of least Bell's vireos or southwestern willow flycatchers from fuel modification activities due to the avoidance of riparian habitat required in the MOU. An unquantifiable number of least Bell's vireos may be subject to harassment from noise associated with upland vegetation abatement in areas adjacent to riparian zones for short periods of time early in their breeding season.

The Service anticipates no take of red-legged frogs, San Diego fairy shrimp, or Riverside fairy shrimp as a result of implementation of the MOU due to riparian and vernal pool avoidance measures.

The Service anticipates no take of the Pacific pocket mouse from the proposed action due to its limited known distribution and unlikely occurrence adjacent to human dwellings.

The Service anticipates an unquantifiable number of SKR may be taken as a result of vegetation abatement activities in connection with fire protection.

The Service anticipates no take of Laguna Mountains skippers because of the limited number of structures within the grassland habitat occupied by this species.

The Service anticipates no take of the Quino checkerspot butterfly due to its highly restricted known distribution and unlikely occurrence adjacent to human dwellings.

### **Reasonable and Prudent Measures**

The Service believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize take of the coastal California gnatcatcher, southwestern arroyo toad, southwestern willow flycatcher, or least Bell's vireo.

1. Measures shall be taken to minimize take associated with fuel abatement activities.
2. Measures shall be taken to minimize loss of habitat resulting from fuel abatement activities.
3. Measures shall be taken to collect and use data relevant to planning and implementation of fire management programs.
4. Measures shall be taken to assure compliance with the MOU commitments and the

terms and conditions of this BO.

### **Terms and Conditions**

1. To implement Reasonable and Prudent Measure Number 1, the Service will implement the following terms and conditions:
  - (a) The Service shall work with Fire Chiefs and Fire Districts to make available to property owners and vegetation abatement contractors information regarding  
  
vegetation abatement methods and fire hazard reduction methods that impacts to threatened, endangered, and other sensitive wildlife.
  - (b) The Service shall, in coordination with the Department, make available to the Fire Chiefs and Fire Districts information and maps related to the distribution of riparian areas, vernal pools, and listed and proposed sensitive plants and wildlife, to facilitate avoidance and notification of potential impacts to sensitive species.
2. To implement Reasonable and Prudent Measure number 2, the Service will implement the following terms and conditions:
  - (a) The Service shall work with the Department, Fire Chiefs and Fire Districts to establish an effective method for tracking habitat loss, and provide annual information on habitat loss due to vegetation abatement activities.
  - (b) The Service shall require that the Fire Chiefs and Fire Districts continue to avoid entry into and immediately alongside riparian habitats and vernal pools using the best available habitat mapping, field personnel training, and guidance by the Service and the Department. Areas immediately adjacent to such habitats will be cleared using hand-clearing methods only.
  - © The Service shall work with the Department to provide annual CSS identification training, including a training video, to the Fire Districts.
  - (d) The Service shall require that each Fire District by December 31 of each calendar year, provide the Service's Carlsbad Field Office with a report listing the parcel numbers and approximate habitat acreage of CSS subject to vegetation abatement notification during the same calendar year.
  - (e) The Service shall consider the CSS acreage lost to vegetation abatement as part of the 5% interim habitat loss provisions set forth under the gnatcatcher 4(d) rule.
3. To implement Reasonable and Prudent Measure number 3, the Service will implement the

following terms and conditions:

- (a) The Service shall cooperate with Fire Chiefs, Fire Districts, and CDF in providing information and expertise regarding vegetation abatement and fire management plans to those entities responsible for managing large blocks of wildlife habitat within San Diego County.
  - (b) The Service shall work with each party to the MOU to support interagency efforts to collect and utilize data relevant to planning and implementation of fire management programs that address potential impacts to threatened, endangered and other sensitive plant and wildlife species.
  - © The Service shall require that the Fire Chiefs and Fire Districts assist entities responsible for wildlife reserves in the development of appropriate fire management plans.
  - (d) The Service shall work with Fire Chiefs and Fire Districts in advising Fire Department personnel during the annual planning for the implementation of the vegetation abatement program in matters related to threatened and endangered species.
4. To implement Reasonable and Prudent Measure number 4, the Service will implement the following terms and conditions:
- (a) The Service shall fully meet its MOU commitments and assure by its participation in annual planning regarding vegetation abatement programs that the measures included in the MOU and this Biological Opinion are implemented to the full extent.
  - (b) The Service shall work cooperatively with local jurisdictions to ensure that future development is planned under the guidelines set forth in the Bates Bill, which directs future vegetation abatement activities and fire management activities to be contained within the development footprint unless it is otherwise provided for in an approved NCCP document. These requirements and their impacts should be adequately addressed in the NEPA and CEQA review and documentation of the future projects.

If at any time during the term of the MOU it becomes known to the Fire Districts and Fire Chiefs that the amount or extent of incidental take for any of the listed species addressed in this opinion has reached the stated limits, they shall immediately notify the Service in writing. If the incidental take limit is exceeded, the Service shall advise the Fire Districts and Fire Chiefs to cease the activities resulting in take and the Service shall re-initiate internal consultation immediately to avoid further violation of section 9 of the ESA. The Service shall request the Fire Districts and Fire Chiefs to provide an explanation of the taking.

### **Disposition of Sick, Injured and Dead Specimens**

The Service's Carlsbad Office must be notified at (619) 431-9440 within three working days should any listed or proposed animal species be found dead or injured in or adjacent to areas subjected to vegetation abatement activities. Notification must include the date, time, location of the carcass, cause of death or injury, and any other pertinent information. If necessary, the Service will provide a protocol for the handling of dead or injured listed or proposed animals. In the event that the Fire Chiefs or the Fire Districts suspect that a species has been taken in

contravention of any federal, state, or local law, all relevant information shall be reported within 24 hours to the Carlsbad Office or to the Service's Division of Law Enforcement, San Diego, California, at (619) 557-5063.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. The term conservation recommendations are suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibility for these species.

1. The Service should conduct surveys to verify the presence or absence of listed and proposed plant species in areas due for fuel modification activity.
2. The Service should work with the Department, the Fire Chiefs and the Fire Districts to coordinate and cooperate to the maximum extent practical in the development and implementation of fire management plans for the wildlife preserves that are being established in western San Diego County.
3. The Service should work with the Department, the Fire Chiefs and the Fire Districts to support, to the maximum extent possible, further data collection and investigations into the effects on sensitive plants and wildlife resulting from management activities, including vegetation abatement.
4. The Service should urge the Fire Chiefs and Districts to consider architectural and design guidelines that minimize the threat of fire to structures, when determining the amount of vegetation removal necessary for effective establishment of individual firebreaks.

REINITIATION NOTICE

This concludes formal consultation/conference on the proposed participation of the Service with San Diego County fire protection organizations in a Memorandum of Understanding regarding county-wide construction of fuelbreaks adjacent to wildlands. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Biological/Conference Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this

Biological/Conference Opinion; or (4) a new species not covered by this opinion is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Any questions or comments should be directed to John Lovio or Nancy Gilbert at the Carlsbad Field Office at (619) 431-9440.

**Literature Cited**

- Brown, J. W. and D. K. Faulkner. 1984. Distributional records of certain Rhopalocera in Baja California, Mexico, with the description of a new subspecies of *Papilio (Hericleides) astyalus* (Godart) (Lepidoptera: Papilionidae). *Bulletin of the Allyn Museum* 83.
- Brown, J. W. 1991. Sensitive and Declining Butterfly Species (Insecta: Lepidoptera) in San Diego County, California. unpub. manuscript, Dudek and Associates, Inc., Encinitas CA.
- Hickman, J. C. (ed.). 1993. *The Jepson Manual of higher Plants of California*. University of California Press, Berkeley. p. 955.
- James, R. 1993. Coastal sage scrub. Page 95 in: Lowe, J.D. (editor). Resident bird counts 1992. *Journal of Field Ornithology* 64 (1; supplement).
- Kulfan, M. and J. Kulfan. 1990(92). Changes of distribution of thermophilous butterflies in Slovakia. *Journal of research on the Lepidoptera* 29: 254-266.
- Laymon, S.A. 1987. Brown-headed cowbirds in California: historical perspectives and management opportunities in riparian habitats. *Western Birds* 18(1):63-70.
- Levy, J. N. 1994. *Status of the Laguna Mountains Skipper (Pyrgus ruralis lagunae J Scott)*. Biological survey and analysis prepared for the Forest Service, U.S. Department of Agriculture.
- Ligon, J. S. 1961. *New Mexico Birds and Where to Find Them*. University of New Mexico Press.
- Lovio, J.C. 1993. Diegan coastal sage scrub I. Pages 95-96 in: Lowe, J.D. (editor). Resident bird counts 1992. *Journal of Field Ornithology* 64 (1; supplement).
- Lusby, G.C. 1970. Hydrologic and biotic effects of grazing vs. non-grazing near Grand Junction, Colorado. *Journal of Range Management* 23(4): 256-260.
- Marlow, C.B. and T.M. Pogacnik. 1985. Time of grazing and cattle-induced damage to stream banks. In: *Riparian Ecosystems and Their Management: Reconciling Conflicting Uses*. R.R. Johnson, C.D. Ziebell, D.R. Patton, P.F. Folliott, and R.H. Hamre (technical coordinators), First North American Riparian Conference. U.S.D.A. Forest Service General Technical Report RM- 120. Pp. 279-284.
- Matson, R.H. 1978. Undisturbed coastal sage scrub. Pages 106-107 in: Van Velzen, W.T. and A.C. Van Veizen (editors). Forty-first breeding bird census. *American Birds* 32 (1).

- Mayfield, H.F. 1977. Brown-headed cowbird: agent of extermination? *American Birds* 31:107-113.
- Moffat, M. and N. McPhillips. 1993. *Management for Butterflies in the Northern Great Plains: A Literature Review and Guidebook for Land Managers*. South Dakota Field Office, Ecological Services, U.S. Fish and Wildlife Service.
- Monson, G. and A.R. Phillips. 1981. Annotated checklist of the birds of Arizona. The University of Arizona Press, Tucson, Arizona. 240 pp.
- Muiznieks, B.D., S.J. Sferra, T.E. Corman, M.K. Sogge, and T.J. Tibbitts. 1994. Arizona Partners in Flight southwestern willow flycatcher survey, 1993. Draft Report: Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix, Arizona. April 1994. 28 pp.
- Murphy, D. D. 1990. A report on the California butterflies listed as candidates for endangered status by the United States Fish and Wildlife Service. Draft Report for the California Department of Fish and Game, Contract No. c-1755. 60 pp.
- Royer, A. R. and G. M. Marone. 1992. Conservation status of the Dakota sldpper (*Hesperia dakotae*) in North and South Dakota. Report to the United States Fish and Wildlife Service, Denver, Colorado.
- Scott, J. A. 1981. New Papilionidae and Hesperioidea from North America. *Papilio* (new series) 1: 1-12.
- Thomas, C. D. and T. M. Jones. 1993. Partial recovery of a skipper butterfly (*Hesperia comma*) from population refuges: lessons for conservation in a fragmented landscape. *Journal of Animal Ecology* 62: 472-481.
- Thomas, C. D., J. A. Thomas, and M. S. Warren. 1992. Distributions of occupied and vacant butterfly habitats in fragmented landscapes. *Ecology* 73: 563-567.
- Unitt, P. 1984. The birds of San Diego County. Memoir 13, San Diego Society of Natural History.
- Unitt, P. 1987. *Empidonax traillii* extimus: an endangered subspecies. *Western Birds* 18(3):137-162.
- U.S. Fish and Wildlife Service. 1995. Draft least Bell's vireo recovery plan. Portland, Oregon.